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CIRCUIT ARRANGEMENT FOR BRIEFLY MAINTAINING AT LEAST ONE INTERNAL NORMAL D.C. VOLTAGE UPON FAILURE OF THE VEHICLE ELECTRIC SYSTEM SUPPLY VOLTAGE

Field Of The Invention

The present invention is directed to a circuit arrangement.

Background Information

To an increasing extent, electronic circuits in the automotive field must be able to fulfill a full or restricted scope of functions (sending messages to telephone modules for emergency calls, deployment of airbags, etc.) for a certain period of time (reserve power time) after the vehicle electric supply voltage has been shut down or the battery has been disconnected (e.g., in a collision).

In control units today, the power required for this is typically stored temporarily in a capacitor. According to the equation $W = \frac{1}{2} C U^2$, this power is proportional to capacitance C of the capacitor and the square of voltage U. To minimize capacitance C of the capacitor and be able to store a large amount of power, the capacitor is usually charged to a voltage which is higher than the vehicle electric system supply voltage, via a step-up regulator, which is generally designed as a switching regulator.

In the event of loss of power supply voltage, power is taken from the reserve energy capacitor via one or more step-down regulators which generate the required internal normal d.c. voltage(s).

This is explained in greater detail below with reference to Figure 1 of the drawing.

Figure 1 shows a circuit arrangement known from the related art in a highly schematized style, with vehicle electric system supply voltage V_{BAT} being supplied to the voltage input at the left in the figure via a non-reversible diode 1 and the voltage output at the right in the

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